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AL REPORT TO CONGRESS

THE TULE ELK

IN CALIFORNIA - March 1, 1979

prepared by the
Bureau of Land Management
for the secretary of the interior
under PL 94 389

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3rd ANNUAL REPORT TO CONGRESS

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TABLE OF CONTENTS

		PAGE
I	INTRODUCTION	1
II	PRESENT STATUS OF TULE ELK HERDS	5
	Owens Valley	
	Cache Creek	
	Tupman Tule Elk Reserve	
	San Luis National Wildlife Refuge	
	Concord Naval Weapons Station	
	Grizzly Island	
	Mount Hamilton	
	Lake Pillsbury	
	Point Reyes National Seashore	
	Jawbone Canyon	
	Camp Roberts	
	Fort Hunter Liggett	
III	RELOCATION PROPOSALS	21
	Fort Ord	
	Vandenberg Air Force Base	
	US Forest Service	
	Cottonwood Creek	
IV	STATEWIDE MANAGEMENT PLAN	24
V	DISCUSSION	26
VI	ACTIONS NECESSARY TO PRESERVE THE TULE ELK	30

LIST OF TABLES AND FIGURES

TABLES

		PAGE
Table 1	Summary of the status of the Tule Elk and its habitat.	27
Table 2	Summary of adverse effects of land use practices on the Tule Elk and the status of Tule Elk Management Plans.	29
Table 3	Potential Tule Elk populations, current and proposed habitat areas.	31

FIGURES

Figure 1	Current distribution of Tule Elk Herds in California.	2
Figure 2	Original distribution of Tule Elk in California.	4
Figure 3	Tule Elk and habitat of the Owens Valley.	6
Figure 4	Tule Elk habitat at Cache Creek.	9
Figure 5	Tule Elk at the Tupman Tule Elk Reserve.	12
Figure 6	Tule Elk of the San Luis National Wildlife Refuge.	14
Figure 7	Potential Tule Elk relocation sites.	23

I. INTRODUCTION

This is the third annual report submitted as a requirement of P.L. 94-389, the Joint Resolution for Federal Participation in Preserving the Tule Elk Population in California. The first report dated March 1977 was preliminary in nature, while the March 1978 report was an update and elaboration of concepts outlined in 1977.

The present report is based on a similar format and includes the following: (1) a summary of the current status and condition of all tule elk herds and their respective habitat; (2) a description of the work in progress; (3) an analysis of objectives and status of the statewide management plan; and (4) recommendations for the continued management and expansion of tule elk range.

Tule elk presently inhabit twelve separate areas of California (Fig. 1). However, only two of these areas (Owens Valley and Cache Creek) have established free-roaming herds. The remainder occupy primarily fenced enclosures. The total population represented by all herds is approximately 812 animals.

In August of 1977 a Tule Elk Interagency Task Force was organized to recommend guidelines for relocating surplus elk and to evaluate the suitability of areas proposed as relocation sites. The following agencies are represented on the Task Force:

1. Bureau of Land Management (BLM) (Chairman),
2. U.S. Forest Service (USFS),
3. National Park Service (NPS),
4. U.S. Army,
5. U.S. Navy,
6. Fish and Wildlife Service (FWS),
7. California Department of Fish and Game (CDFG), and
8. California Department of Parks and Recreation (CDPR).

In addition to the above government groups, a number of private organizations have participated in Task Force meetings. These include the following:

1. Committee for the Preservation of the Tule Elk,
2. Sierra Club,
3. West Coast Humane Society,
4. Animal Protection Institute,
5. Defenders of Wildlife,
6. California Wildlife Trust, and
7. Fund for Animals

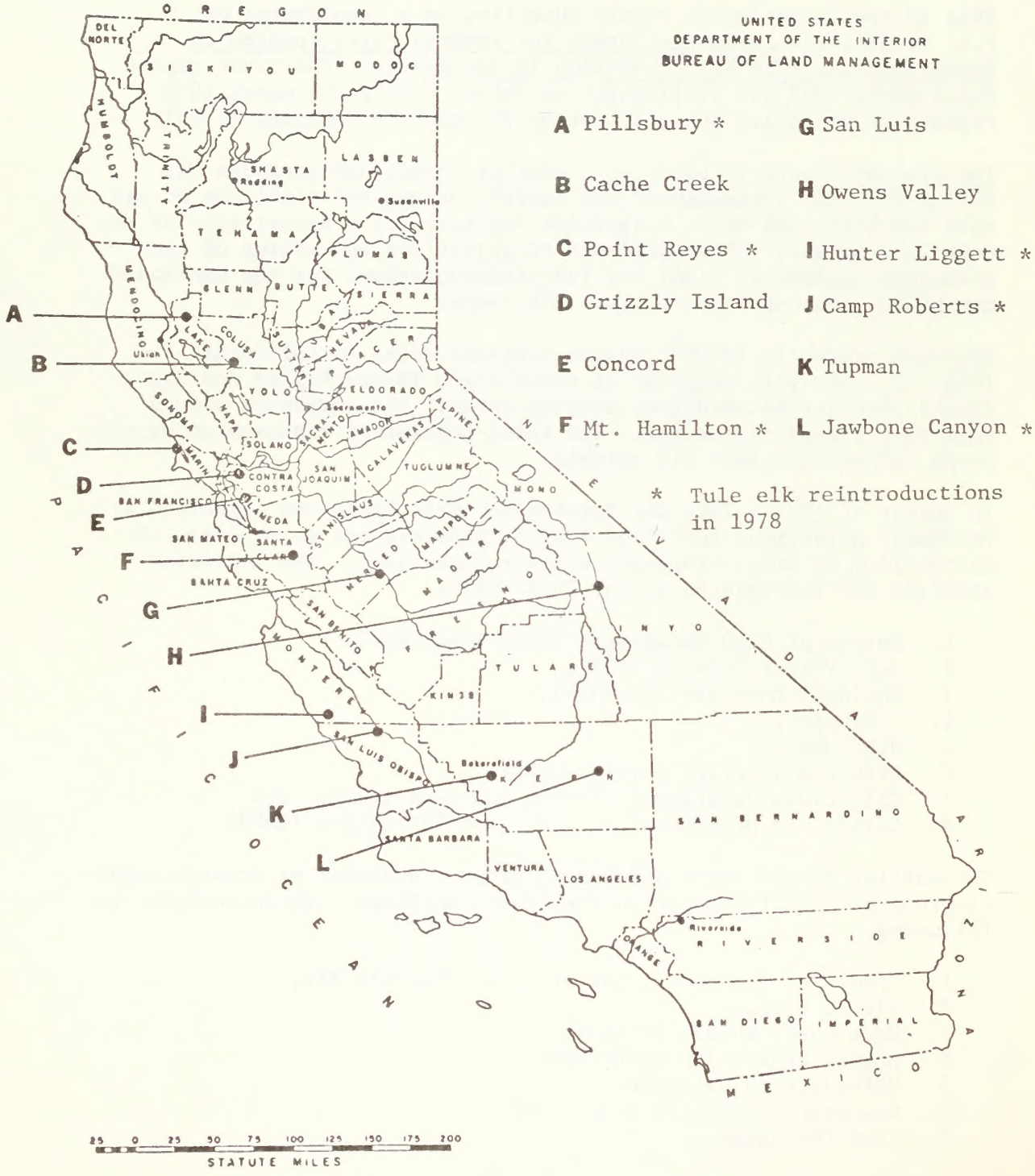

Figure 1. Current distribution of tule elk herds in California

HISTORY

Prior to the 19th Century as many as 500,000 tule elk (Cervus elephus nannodes) inhabited the central and coastal valleys of California. Their original range extended from Cow Creek in Shasta County south through the Central Valley to Buena Vista Lake in Kern County. This endemic subspecies also ranged to the San Francisco Bay area and in the vicinity of Monterey, San Luis Obispo and northern Ventura counties (Fig. 2).

Early explorers to California were impressed with the large numbers of elk that utilized the perennial bunch grass ecosystem. Herds numbering as many as 2,000 were observed in the Sacramento River Delta, Tulare Lake area, and Buena Vista Lake region.

Significant changes in the ecosystem of which the tule elk was a part were brought about with the Spanish settlement of California. The replacement of the once dominant perennial bunch grasses with introduced annuals (as well as competition from large free roaming herds of domestic stock belonging to the large ranchers and mission system of the period) had an adverse effect on tule elk populations.

In the early 1800's a profitable hide and tallow export market was developed near the settlements and missions of early California. Elk and deer were readily available to supplement this industry; with no laws governing the harvest, as many as 3,000 elk and deer hides were exported annually.

The fur brigades entering the interior of California in search of beaver in the 1830's also took large numbers of tule elk to the extent that numbers were noticeably reduced in many areas. However, with the discovery of gold in California in 1848 the entire ecological, social, and economic base of the region was altered. The rapidly growing population required food, and market hunting became commonplace. By 1860 the tule elk existed only in the marshes of Tulare and Buena Vista Lakes. Draining of these marshes in the 1860's exposed the remaining animals to market hunting, and in 1870 the tule elk was nearly extinct.

In 1873 the California State Legislature granted the tule elk complete protection. Nevertheless, in 1875 only a single pair of tule elk were sighted in the marsh lands of the Miller and Lux Ranch at Buttonwillow, Kern County. There is some evidence that all of the tule elk present today may have descended from that single pair.

In 1895 the tule elk population of California numbered 28 individuals. The initial growth of this herd was slow, but by 1923 the herd numbered approximately 400 animals. In order to relieve crop depredation, a number of elk relocations were attempted between 1904 and 1934. Most of these failed. However, in two instances

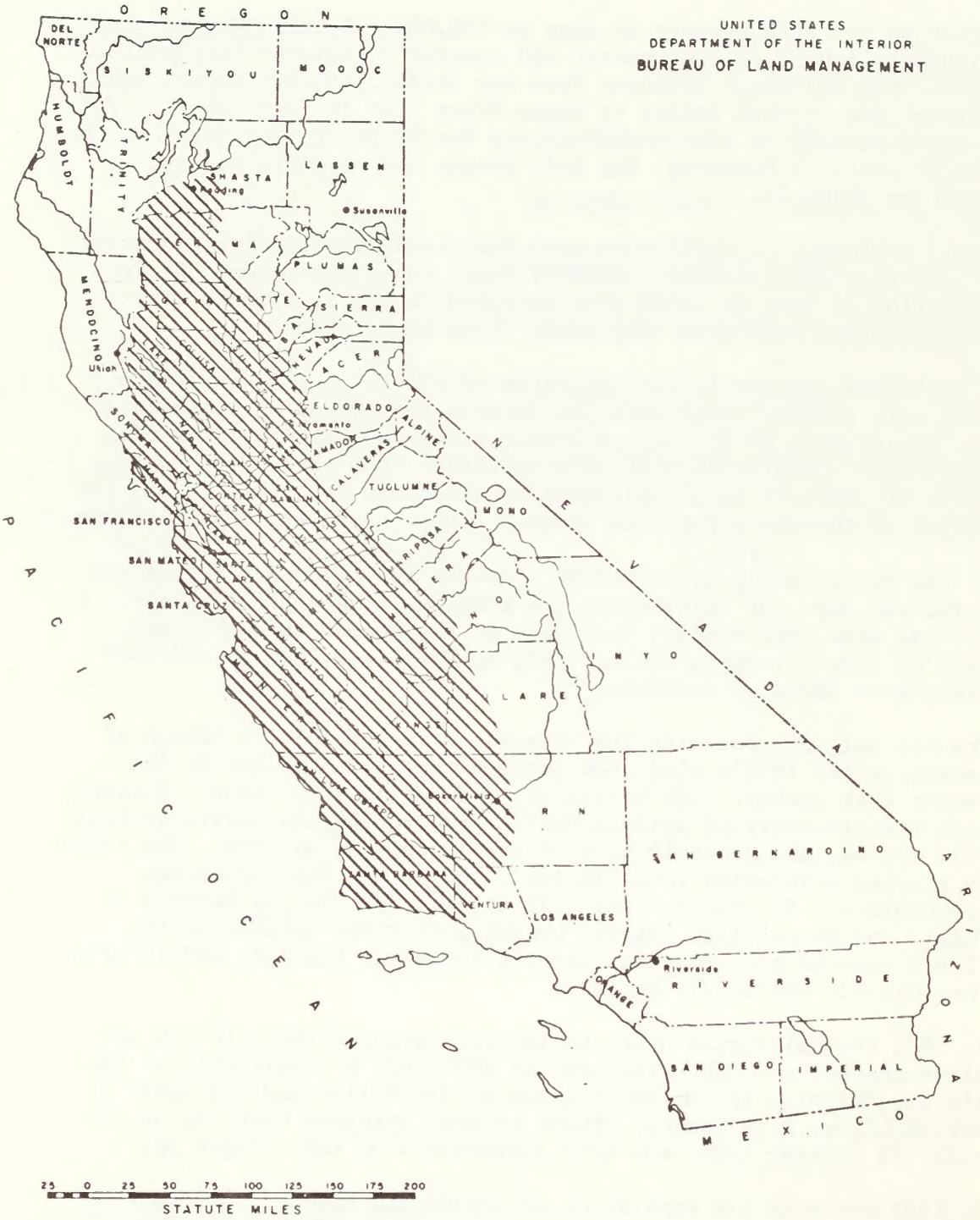

Figure 2. Original distribution of tule elk in California

Source: D. R. McCullough 1969

free-ranging herds were established: one in the Cache Creek area of Colusa County and another in the Owens Valley.

The tule elk herd inhabiting the Owens Valley grew rapidly and expanded its range. As the number of elk increased, a conflict of interests developed between those who favored the presence of elk in the valley and the ranchers who suffered crop and fence damage. Between 1952 and 1969 a number of public hunts were conducted to keep tule elk populations at prescribed levels, and thereby reduce the incidence of depredations. However, due to public opposition the hunts were discontinued.

In 1971 the State Legislature enacted Senate Bill 722 prohibiting the taking of tule elk until the total statewide population exceeded 2,000 animals, or until it is determined by the Legislature that suitable habitat to maintain a population of that size cannot be found. At the same time this bill limited the total number of elk inhabiting the Owens Valley to 490 or any greater number determined to be the Owens Valley carrying capacity. In 1976 Federal legislation in the form of Public Law 94-389 provided for Federal participation in preserving tule elk populations in California. This report is submitted in compliance with that legislation. This legislation, while agreeing to the 490 elk carrying capacity of the Owens Valley, stated that the conservation and restoration of at least 2,000 tule elk was an appropriate national goal. At the same time it directed the Secretaries of Agriculture, Defense, and the Interior to cooperate with the State of California in making Federal lands reasonably available for the preservation and grazing of tule elk in such a manner as may be consistent with Federal law.

II. PRESENT STATUS OF TULE ELK HERDS

OWENS VALLEY

1. Nature and Condition of the Habitat

The Owens Valley is an arid, 75-mile long valley in eastern California (Fig. 3). The habitat varies from wet meadows in the valley floor through desert scrub and sagebrush on the alluvial fans to coniferous forests in the mountains. Of the 200,000 acres within the current range of the tule elk in this area, the city of Los Angeles and private interests own about 90,000 acres (46 percent). The BLM and USFS administer about 55,000 acres (27 percent) each.

Although the majority of the habitat is in fair to good condition, portions of the habitat, as revealed by vegetative transects, are in unsatisfactory condition because of overutilization by livestock and wildlife. These problems have been compounded by two years of

Figure 3. Tule elk and habitat of the Owens Valley

drought. Above normal precipitation during the 1977-1978 winter has improved forage production on these areas.

2. Number and Condition of the Elk

In August 1978 the California Department of Fish and Game conducted a population census which revealed an increase in numbers of elk in the Owens Valley. The 1978 population is compared with the 1976 and 1977 populations below.

Herd Unit	1976 Census	1977 Census	1978 Census	Recommended Herd Size
Bishop	89	133	121	100
Tinemaha	96	114	97	100
Independence	113	111	108	80
Goodale	89	116	87	70
Lone Pine	91	89	96	80
Mt. Whitney	0	19	5	60
Total	478	582	514	490

In late 1977 and early 1978, 79 elk were relocated from the Owens Valley. Four additional animals died during capture and 9 animals died from other causes, including vehicle accidents and disease. This lowered the total population from 582 to 490, the carrying capacity.

The 1978 census indicated a minimum population of 514, 24 above the capacity. Local biologists felt this count was low, so a second count was conducted with a result of 514 elk. It is still possible additional elk are present.

In October and November, 51 elk were relocated from the Owens Valley. This left a minimum population of 463. One of the animals captured in October 1978 had foot rot and later died as a result. Several cases of limping elk have been reported, but in general the elk appear in good condition.

3. Effects of Actual or Proposed Land-use Practices

The City of Los Angeles Department of Water and Power has proposed to increase the amount of ground water pumping from the Owens Valley. Such an increase would be detrimental to the elk since it will tend to reduce the number of animals the effected area can support (CDFG as consultant to LADWP). This proposal has resulted in a complex law suit and the preparation of two environmental impact reports (EIR's). The EIR's discuss the impact on elk and suggest mitigation measures, but the exact result of such a program is difficult to ascertain. The situation should be carefully monitored to ensure that appropriate mitigation measures are enacted.

4. Status of the Management Plan

The Owens Valley Tule Elk Habitat Management Plan has been completed in a joint effort by Inyo National Forest, Los Angeles Department of Water and Power, California Department of Fish and Game, and Bureau of Land Management. It is now in the process of being implemented.

5. Recommendations to Preserve the Elk

The Habitat Management Plan provides for the continued protection of the tule elk. Implementation of that plan should be continued. In summary, its provisions are:

a. Each herd will be maintained at a population level which is in line with the carrying capacity of the habitat. The maximum number of elk recommended for the Owens Valley is 490.

b. The management agencies will develop an appropriate number of springs and other water sources to benefit the elk and will undertake habitat improvements to increase the amount of available forage.

c. Off-road vehicles (ORV) will be restricted to minimize the amount of habitat destruction and harassment to the elk.

d. Livestock allotments and leases will be managed under sound habitat and range management practices.

e. Because mining activity may have a negative impact on the elk and their habitat, several key areas have been recommended for withdrawal from mineral entry.

f. The management agencies will experiment with devices and techniques to minimize the amount of alfalfa eaten and damaged by the elk.

g. Additional studies will be initiated to fill gaps in our knowledge of the elk.

h. The agencies will continue efforts to increase public awareness of the tule elk and provide additional opportunities for public viewing and study.

CACHE CREEK

1. Nature and Condition of the Habitat

The Cache Creek herd utilizes approximately 58,000 acres of oak-grassland, chaparral, and riparian growth in the inner coastal foothills located about 80 miles northwest of Sacramento (Fig. 4). The

Figure 4. Tule elk habitat at Cache Creek

BLM administers approximately one-third of this land. The remainder is in private ownership.

The above average rainfall of the winter and spring of 1978 resulted in an increase in the amount of forage available to elk during a portion of the past year. As part of a habitat management plan prepared cooperatively by BLM and CDFG in 1977, approximately 190 acres of brush have been converted to grass and legumes. Two reservoirs have been constructed. The habitat is currently in poor condition due to heavy grazing by domestic livestock in key bottom lands.

2. Number and Condition of the Elk

The present Cache Creek herd is estimated at 80-100 animals. An aerial census of this herd will be conducted in February or March 1979. The elk are in fair condition.

3. Effects of Actual or Proposed Land-use Practices

Heavy grazing of key bottom lands in private ownership continues to have an adverse effect on tule elk habitat. A subdivision has been proposed for the Wilson Valley, an area of private lands approximately three-quarters of a mile from present BLM/CDFG habitat improvement projects. Should such a development occur, it would adversely affect the elk and may even lead to elimination of this herd.

There has also been an increase in the cutting of oak trees for firewood on private lands utilized by tule elk. This will result in reduced acorn production, an important fall food source for elk as well as other wildlife species. The portion of BLM land in the elk range containing habitat improvement projects has been proposed as a roadless wilderness study area.

4. Status of the Management Plan

The BLM, in cooperation with the CDFG, prepared and approved a habitat management plan for this herd in 1977.

5. Recommendations to Preserve the Elk

a. Purchase private lands of critical importance to the elk.

b. Construct fences to eliminate livestock trespass.

c. Continue the conversion of brush to grasslands to increase the amount and availability of elk forage.

d. Remove public lands from mineral entry.

e. Construct additional reservoirs; protect riparian areas; and develop additional springs, seeps, and meadow habitat.

TUPMAN TULE ELK RESERVE

1. Nature and Condition of the Habitat

The Tupman Tule Elk Reserve, administered by the CDPR, is a 685-acre fenced enclosure 25 miles west of Bakersfield (Fig. 5). The elk are fed to supplement the vegetation of the compound (90% annual grass and forbes, 10% perennials). Although this unit provides transplant stock for the rest of California, it resembles a zoo like operation. A 38-acre automated irrigation system has been installed to provide additional habitat. The natural forage of the area will support 30 adult elk for four months. Supplemental feeding will be required during the remainder of the year. For the past 5 years the maintenance of animals above the carrying capacity of the area and recent drought conditions have been detrimental to the enclosed pasture lands. Through transplant efforts, the 73 elk occupying this area were reduced to 30 animals in December 1978. Proposed habitat improvements will increase the carrying capacity by 50 to 100 percent.

2. Number and Condition of the Elk

Because the 30 elk presently in the Tupman Reserve are fed a supplement, they are in excellent condition. Recruitment after the 1978 calf crop was 17 animals; after the 1978 relocation efforts, the projected 1979 recruitment level is 5 animals.

3. Effects of Actual or Proposed Land-use Practices

There are no known uses which may conflict with the elk or their habitat in this unit.

4. Status of the Management Plan

The CDPR has completed a management plan and manages this unit as an area for public viewing of tule elk. A basic resource inventory study is being developed.

5. Recommendations to Preserve the Elk

a. The proposal for additional acres of irrigated pasture should be completed.

b. Acquire additional lands adjacent to the west pasture; pla and implement overall project improvement to increase carrying capacity.

c. Rebuild the Buena Vista Canal fence and crossings to increase lands available to the elk by 200 acres.

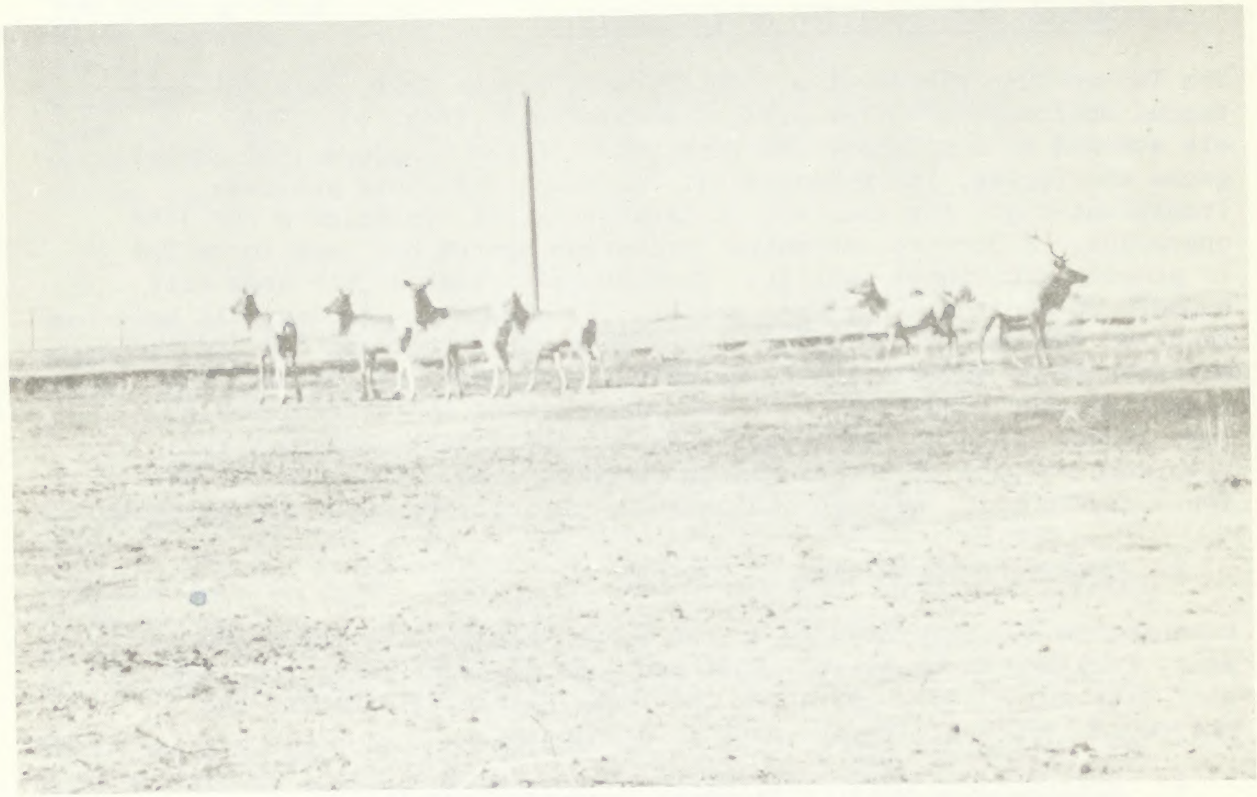

Figure 5. Tule elk at the Tupman Tule Elk Reserve

d. Because this is the last location where tule elk could originally be found in a free-roaming state before relocation efforts, maintain this habitat in as natural a condition as possible.

SAN LUIS NATIONAL WILDLIFE REFUGE

1. Nature and Condition of the Habitat

San Luis Island is a unit of the National Wildlife Refuge System and is managed by the Fish and Wildlife Service. A ten-foot high fence surrounds 761 acres of grass covered uplands, wooded sloughs, and marsh habitat (Fig. 6). The habitat is currently in good condition.

2. Number and Condition of Elk

There are currently 38 elk on San Luis Island. The animals are in excellent condition.

3. Effects of Actual or Proposed Land-use Practices

There are no known uses which may adversely affect the elk on the refuge.

4. Status of the Management Plan

The FWS has completed a management plan and is proceeding with its implementation.

5. Recommendations to Preserve the Elk

Maintain a population level consistent with the grazing capacity of 40 animals. Herd growth will reach a level of approximately 47 animals in mid 1979. Thus, provisions will have to be made to move these excess animals from the area.

CONCORD NAVAL WEAPONS STATION

1. Nature and Condition of the Habitat

This facility, located on the east side of San Francisco Bay, was offered by the Navy in 1976 as a site having potential for the re-introduction of tule elk. Approximately 2,100 acres of fenced rolling grassland with scattered trees and livestock watering facilities are available for utilization by the elk. Due to the above average rainfall of the past year and controlled livestock grazing practices the habitat is in excellent condition with an abundance of forage. However, natural riparian habitat and green summer forage

Figure 6. Tule elk of the San Luis National Wildlife Refuge

(essential for tule elk summer range) are limited on this site. Present uses of this area include ammunition storage, livestock grazing, and other wildlife habitat management.

The U.S. Navy in cooperation with the CDFG and Wildlife Conservation Board has constructed 15,000 linear feet of seven-foot high fence along a portion of the Station boundary. With the completion of this work an elk management area of approximately 2,100 acres is now enclosed by a minimum of seven-foot high fencing. In addition, the Navy has fenced a portion of the Contra Costa Canal traversing the management area which has in the past been a hazard to the elk.

2. Number and Condition of the Elk

The Station received its first transplant of seven elk from the Tupman Tule Elk Reserve in January 1977. In November 1977, 31 additional elk were relocated to the Station from Owens Valley. Since that time, the loss of breeding stock to accidents, disease, and escapes has exceeded the number of calves born. However, the previous situation has been remedied and the current population of 33 animals is in excellent condition.

3. Effects of Actual or Proposed Land-use Practices

There are a number of livestock grazing leases at this facility. Livestock grazing is controlled by Soil and Water Conservation Plans which are a part of the lease agreements. Seasons of use, stocking rates, grazing capacities, and distribution of animals are factors covered in these plans. It is not anticipated that this use will adversely impact the elk.

4. Status of the Management Plan

The Navy has signed an agreement with the Wildlife Conservation Board and the CDFG. A management plan is to be developed jointly by the Navy and CDFG.

5. Recommendations to Preserve the Elk

Continued sound grazing management of elk and domestic livestock should provide adequate fall, winter, and spring habitat for a proposed population of 45 tule elk. It is recommended that those managing agencies involved activate a plan for the planting of forage species that will provide an adequate diet for elk during the summer months. Until adequate summer forage is produced on the management area, supplemental feeding may prove necessary.

GRIZZLY ISLAND

1. Nature and Condition of the Habitat

Grizzly Island, and 8,600-acre State waterfowl refuge administered by the California Department of Fish and Game, is in the San Francisco Bay area. The unfenced refuge, which is surrounded by sloughs, is comprosed of barley fields and natural marshlands with intermittent stands of willow and eucalyptus trees. The habitat is in excellent condition.

2. Number and Condition of the Elk

There are presently 14 elk on Grizzly Island, and they are currently in good condition.

3. Effects of Actual or Proposed Land-use Practices

The only foreseeable adverse effects may involve farmland depredation.

4. Status of the Management Plan

The California Department of Fish and Game is developing specific plans for management of the elk on Grizzly Island.

5. Recommendations to Preserve the Elk

The California Department of Fish and Game estimates that elk habitat on Grizzly Island will support 30 animals. The herd should be maintained at this level.

MOUNT HAMILTON

1. Nature and Condition of the Habitat

This is a large, 35,000-acre privately owned, ranch in northeast Santa Clara County. The habitat is open grassland hills with brush and trees on some of the north slopes and in some canyons. The habitat is currently in good condition.

2. Number and Condition of the Elk

Sixteen tule elk from the Owens Valley were moved to this private ranch in January 1978. In November 1978, 26 additional animals from the Owens Valley were released. The current level is estimated at 39 elk. They appear to be in good condition. Figures are not currently available on the status of the 1978 calf crop.

3. Effects of Actual or Proposed Land-use Practices

The only current use of this habitat is for limited cattle grazing and some privately controlled deer hunting. These practices will have no adverse effects on the elk. The landowners have no plans to change current use.

4. Status of the Management Plan

The CDFG is developing a management plan for this herd.

5. Recommendations to Preserve the Elk

No action is deemed necessary at this time.

LAKE PILLSBURY

1. Nature and Condition of the Habitat

This area located north of Lake Pillsbury in Lake County consists of approximately 22,000 acres. With the exception of 4,000 acres in private ownership, the area is under USFS administration. The area is generally in good condition and is predominated by mixed oak woodland-savannah grass and chaparral.

2. Number and Condition of the Elk

In February 1978, 13 tule elk from the Owens Valley were released on this site after being temporarily held at Grizzly Island from December to February. One bull was shot by hunters in early August. A second bull brought in at the end of August was also shot. From October 25-27 an additional 24 animals were released at this site. One of these animals, a cow, was lost to foot rot, a bacterial infection that once entering the blood stream may cause liver abscesses. The present population of 36 elk is in good condition. Figures are not currently available on the status of the 1978 calf crop, although at least one calf was born.

3. Effects of Actual or Proposed Land-use Practices

The 1983 Pillsbury Timber Sale will occur along the eastern boundary of the present tule elk range. This could be of benefit to the elk by providing additional browse and grass forage. An off-road vehicle trail exists on the tule elk range; however, its impact on the elk is yet to be determined.

4. Status of the Management Plan

Baseline data are currently being collected for input into the herd management plan. As additional information pertaining to calving, rutting, and other high use areas is collected, more precise information on the impact of proposed land uses will be available.

5. Recommendations to Preserve the Elk

a. Continue data collection for the development of a management plan.

b. Develop a program of public awareness concerning the presence of elk.

POINT REYES NATIONAL SEASHORE

1. Nature and Condition of the Habitat

Point Reyes is a seashore area approximately 40 miles north of San Francisco in Marin County. It is administered by the National Park Service as a National Seashore. The elk release site on Tomales Point consists of 2,600 acres of rolling hills with low chaparral and grasses. Steep drainages on the eastern portion of the Tomales Point Peninsula are heavily vegetated with hardwood shrubs. This area is currently grazed by livestock, and the habitat is in fair condition.

2. Number and Condition of the Elk

In March 1978, 10 tule elk from the San Luis National Wildlife Refuge were released in a temporary enclosure. The 17 elk currently occupying Tomales Point are in good to excellent condition.

3. Effects of Actual or Proposed Land-use Practices

Although there is livestock grazing on the peninsula, litigation is pending concerning this trespass grazing operation. The recent designation of the tule elk reintroduction site as a National Wilderness Area will preclude adverse development of the area.

4. Status of the Management Plan

The Point Reyes Natural Resources Management Plan of June 1976 is currently being updated. The tule elk management proposal of this plan will include range management and research programs.

5. Recommendations to Preserve the Elk

The National Park Service recommends that no additional releases of tule elk occur at Point Reyes. Until proposed studies provide additional data, tule elk populations will not be allowed to exceed 300 animals. When that number or any other number established by proposed studies is reached, or when the current range shows evidence of deterioration, excess elk will be removed.

JAWBONE CANYON

1. Nature and Condition of the Habitat

Unusually large amounts of precipitation have produced an abundance of forage in this area. This privately owned habitat appears to be in good condition.

2. Number and Condition of the Elk

The number and condition of these elk is difficult to determine. Seventeen elk were released into a holding pen in February 1978. They were to be released into a 3,000-acre pen in six months. Four died of liver infections, and 10 escaped from the holding pen. The three left in the holding pen are in good condition. The only confirmed sighting of the ten escapees was the carcass of a lion-killed elk. Recent reports indicate they may be near Cantil. Figures are not currently available on the status of the 1978 calf crop.

3. Effects of Actual or Proposed Land-use Practices

No land use changes are proposed but the future of the elk depends on where they end up. If the animals do cause agricultural depredation they may have to be relocated.

4. Status of the Management Plan

The management plan will not be developed until the status of the herd is better understood.

5. Recommendations to Preserve the Elk

No recommendations will be made until the status is determined.

CAMP ROBERTS

1. Nature and Condition of the Habitat

This facility, administered by the U.S. Army, has extensive acreage suitable as tule elk habitat. There are rolling grassland hills with oak woodland along north-facing slopes and riparian growth along the Nacimiento River. This facility has approximately 40,000 acres of which 25,000 acres are leased for livestock grazing. The remaining area is either intensively used for military purposes or is dense chaparral unsuitable for grazing animals. The habitat is currently in good condition.

2. Number and Condition of the Elk

On December 5, 1978, 21 elk (including six bulls, 11 cows, and four calves) were released into a temporary holding pen. Two animals, one bull and one calf, subsequently died. On December 22, 1978, the remaining 19 were released from the holding pen. As of January 15, 1979, the animals were remaining near the holding pen and were in good condition.

3. Effects of Actual or Proposed Land-use Practices

There are several livestock grazing leases at this facility; however, it is not anticipated that this use will adversely impact the elk.

4. Status of the Management Plan

The California Department of Fish and Game is collecting data to be included in the management plan. The plan will be completed as soon as the appropriate information is obtained.

5. Recommendations to Preserve the Elk

Closely monitor the movements and population levels of the elk to maintain the quality of the habitat and thus keep the herd near the release site.

FORT HUNTER LIGGETT

1. Nature and Condition of the Habitat

This U.S. Army facility encompasses approximately 165,000 acres, of which 120,000 acres are leased for livestock grazing. Tule elk now inhabit the "A" lease lands, a 4,000-acre area along the upper San Antonio River. This area is predominately oak-annual grass woodland in the uplands and willow-meadow riparian near the river. Dense

chaparral borders the area to the north and south. The area has been heavily grazed in the past, but it is recovering rapidly.

2. Number and Condition of the Elk

On December 5, 1978, 22 elk (including five bulls, 14 cows, and three calves) were released. As of January 15, 1979, the elk were remaining in the release area and were in good condition although 1 bull had been lost to poaching activities.

3. Effects of Actual or Proposed Land-use Practices

Livestock grazing has been allowed on this area and may be proposed in the future. The impact on the elk has not been determined.

4. Status of the Management Plan

The California Department of Fish and Game is currently collecting data to be used in the management plan. The plan will be completed as soon as the appropriate data is obtained.

5. Recommendations to Preserve the Elk

Maintaining the habitat in good condition will be the major factor in keeping the elk near the release site. Therefore, elk populations must be kept at a level compatible with the habitat to reduce movements. Any grazing allowed as part of any future lease must be managed to allow regeneration of riparian vegetation and adequate year-round upland vegetation.

III. RELOCATION PROPOSALS

The relocation of tule elk to areas of their historic range is an important part of tule elk conservation policy concerned primarily with diversification and distribution of the resource. The tule elk has historically inhabited the foothills of the central and coastal valleys as well as the marshland and perennial bunchgrass plain of California. Thus, unlike the Rocky Mountain and Roosevelt forms, the tule elk has adapted to a diversity of habitat types and climate patterns. An effective relocation program will not lose sight of the conditions that produced this capacity to adapt in the gene pool of tule elk populations. Tule elk will continue to be relocated to diverse habitat types within their historic range under conditions that call for their continued adaptation to environmental factors.

In addition to providing for the diversification and distribution of tule elk, the establishment of new herds also provides assurance that a catastrophic loss would remove only a portion of the total number. In this sense, distribution exceeds abundance in terms of its importance in the preservation of tule elk populations. Just as it is

advantageous to establish new populations, it is equally important that herds inhabiting the Owens Valley maintain their integrity. Population levels will not be allowed to increase to the point that herd boundaries are dissolved.

A number of criteria have been developed by the Tule Elk Interagency Task Force regarding the evaluation of sites for the establishment of new tule elk herds. These include the following.

1. Geographic Range. The establishment of new tule elk herds is limited to those areas within its historic range.

2. Vegetation. Tule elk graze primarily on grasses and forbs; however, shrubs and other dense vegetation are used for browse as well as cover during the calving period and adverse environmental conditions.

3. Climate. Tule elk evolved under moderate climatic conditions. Areas receiving heavy snows or subjected to severe winters are not considered appropriate tule elk habitat.

4. Water. Water must be available throughout the year.

5. Conflicts with Man. Tule elk compete primarily with man's agricultural interests. At times elk can cause considerable damage to crops, such as alfalfa, and they frequently damage fences. Public lands can be managed primarily for elk; however, before considering private lands, the rights of the private landowner must be respected.

6. Conflicts with Deer. Where elk and deer ranges overlap, deterioration of the vegetation can be significant. This competition for a limited food source is presently occuring in the Goodale range in Owens Valley where tule elk occupy a deer winter range. Any transplant of elk must consider conflicts with other native wildlife species.

7. Maintenance of Natural Populations. For esthetic as well as economic reasons tule elk should be reintroduced to areas where the natural vegetation can support the animals on a year round basis.

8. Maintenance of Pure Stock. Tule elk should be reintroduced only in areas where there is no chance of contact with other races of elk.

The following areas (Fig. 7) are being considered as relocation sites for the establishment of tule elk populations. The first two, Fort Ord and Vandenberg Air Force Base, have been evaluated and determined to be suitable for tule elk under certain conditions.

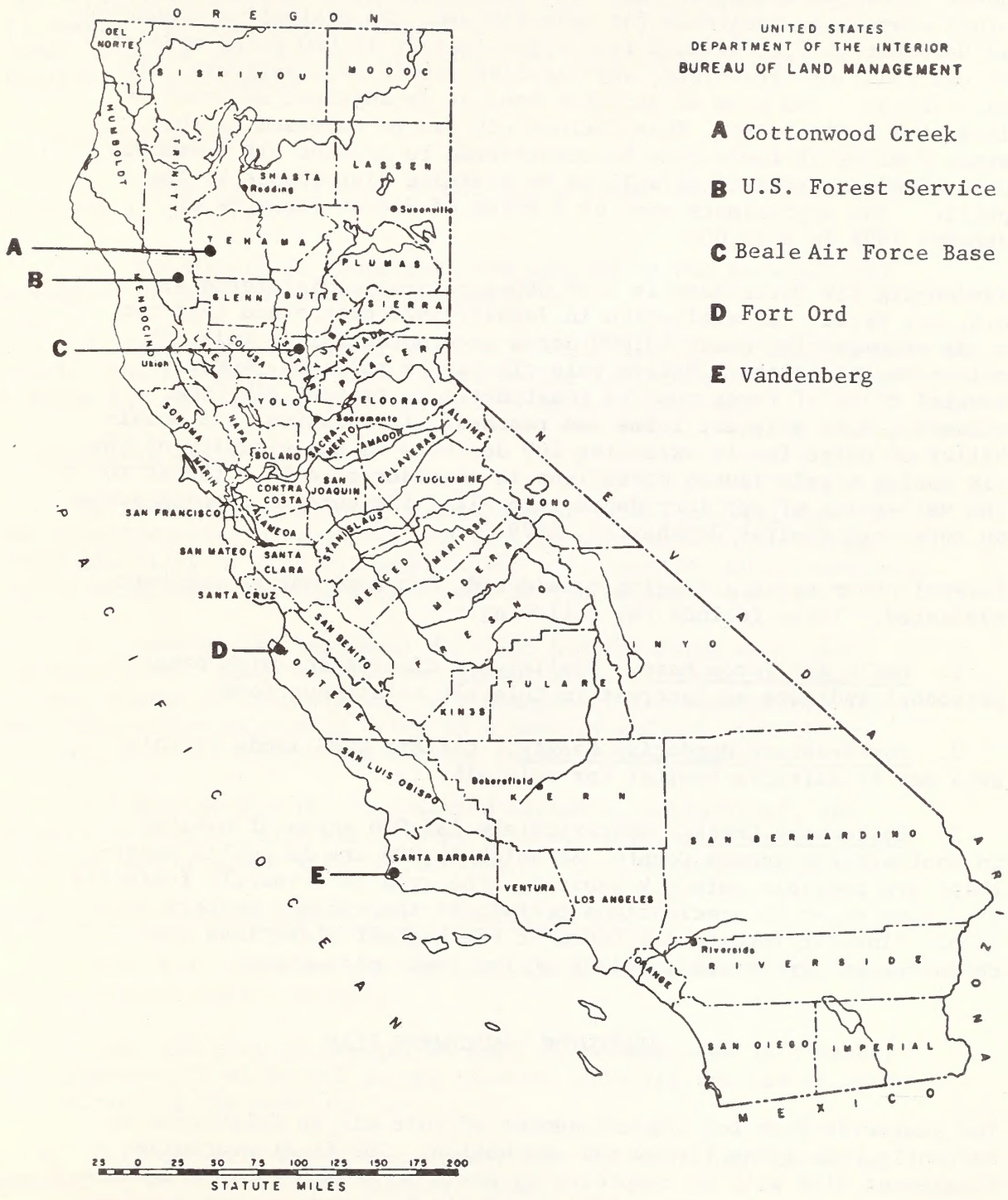

Figure 7. Potential tule elk relocation sites

Fort Ord is a U.S. Army facility of approximately 28,000 acres. About 18,000 acres--dense chaparral growth and areas designated for other uses--are unsuitable for tule elk use. An evaluation conducted in December 1977 determined that approximately 10,000 acres made up of oak woodland, grassland, and riparian growth were suitable tule elk habitat. The area of suitable habitat is adjacent to areas of intensive agriculture. Thus, before elk can be released in this area, 9 miles of fence must be constructed to prevent elk movements onto adjacent farmland as well as to minimize disturbance by the public. The approximate cost of 9 miles of 7-foot fence as of January 1978 is $165,000.

Vandenberg Air Force Base is a 98,000-acre area administered by the U.S. Air Force. An evaluation in January 1978 determined that two areas encompassing about 10,000 acres have potential as tule elk reintroduction sites. Before tule elk can be released, however, several miles of fence must be constructed to prevent elk from wandering onto adjacent farms and ranches. In addition, the possibility of noise levels exceeding 200 decibels in the vicinity of the elk during missle launch operations is considered to be a threat to the well-being of any introduced tule elk. The current grazing lease on this area expires October 31, 1979.

Several other areas are being considered, but have not as yet been evaluated. These include the following:

1. Beale Air Force Base. Preliminary discussions with base personnel indicate an interest in tule elk reintroductions.

2. Northeastern Mendocino County. Certain USFS lands in this area may be suitable habitat for tule elk.

3. Cottonwood Creek. Approximately 135,000 acres of habitat in southwestern Tehama County, of which 26,000 are in public ownership, are possible tule elk habitat. The area is primarily foothills with some steep to precipitious terrain in the extreme western portion. Pine-fir forests are found at the highest elevations with chaparral and grass-oak woodland at the lower elevations.

IV. STATEWIDE MANAGEMENT PLAN

The statewide plan for the management of tule elk in California is currently undergoing review and evaluation. The final statewide management plan will be completed by April 1, 1979. Various agencies, interested private groups, and individuals have made recommendations on the objectives of this plan. Based on this agency and private input, as well as on management progress to date, the statewide management plan consists of two parts: 1) the overall statewide objective for tule elk in California based on both long- and short-term goals, and 2) policy statements and guidelines for the development of management plans for individual tule elk herds and habitats.

Tule Elk Management Objectives

The overall objectives of the statewide tule elk management plan is to ensure the continued existence of healthy, free-roaming tule elk herds of sizes that are ecologically compatible with the suitable habitats of California.

Short-term Goals

1. Identify additional public and private lands to support tule elk in California.

2. Acquire those lands that are crucial to the survival and expansion of herds already established.

3. Provide for greater numbers of tule elk via relocation of viable populations which have the potential to increase to numbers optimum for the habitat into which they were introduced.

Long-term Goals

1. Identify additional public and private lands suitable for the reintroduction of tule elk and acquire when necessary. (Long-range stability of tule elk populations will require public ownership and/or management authority over most of the suitable habitat.)

2. Develop and implement detailed habitat management plans for each herd. (Each habitat management plan will describe the current status of tule elk and make management recommendations for the continued existence of herds in a healthy balance with their habitat, other wildlife, and various forms of land use.)

3. Provide for the diversified esthetic, educational, and scientific uses of tule elk through interpretive and eventually consumptive use programs after objectives of the law have been met.

Policy Statements Included in the Statewide Plan

1. Each tule elk herd will be maintained in a free-roaming state to the maximum extent possible.

2. Tule elk will be managed as part of an ecosystem in a manner that prevents or minimizes damage to other wildlife species or plant life occupying the same habitat.

3. Tule elk will be relocated only into suitable habitat areas assumed to be within their historic range.

4. Surplus tule elk will not be moved to an area with existing tule elk herds, unless the additional animals are needed to ensure the continued well-being of the elk at the transplant site.

5. Individual herds habitat areas will be managed to maintain suitable conditions rather than specific population levels.

6. Management will be directed toward the long-range stability of individual herds and habitats.

7. Long-range stability of tule elk populations will require public ownership and/or management authority over the majority of tule elk habitat.

8. There will be continuing efforts to identify areas suitable as tule elk reintroduction sites.

9. Every opportunity must be taken to inform the public of the complexities of tule elk management and gain input in the development of management plans and effective herd control programs.

Herd Management Guidelines

The development of individual habitat management plans for each established tule elk herd is a major component of the overall statewide management plan. Each plan will describe quantifiable objectives concerning a range of acceptable population levels and habitat conditions, as well as a program of public use. The baseline data required for the development of each habitat management plan are: 1) a description of herd boundaries and movements, as well as the factors that determine them; 2) an identification of calving, holding, and other critical areas; 3) a description of tule elk habitat requirements, range production, and forage use on a seasonal basis; 4) an identification and determination of the effects of mortality factors on tule elk population dynamics; 5) an identification of conflicts between tule elk and other forms of wildlife or other land uses; 6) an evaluation of recruitment potential based on habitat evaluation and present elk population composition.

V. DISCUSSION

The current status of tule elk and their habitats is summarized in Table 1. Tule elk currently occupy 330,236 acres, of which approximately 53 percent is administered by governmental agencies above the local level. The majority of the habitat utilized by tule elk is in good condition. The major exception is Cache Creek which is currently

Table 1. Summary of the Status of the Tule Elk and Its Habitat as of January 15, 1979.

Existing Herds	Management Agency	Approximate Acres	Habitat Condition	Current Number	Est. Max. No. allowable	Current Surplus	Condition of Elk
Owens Valley	BLM	55,000	Good/Fair	463	490	0	Good
	USFS	55,000					
	LADWP						
	Private	90,000					
	TOTAL	200,000					
Cache Creek	BLM	19,000	Poor	90	200[1/]	0	Fair
	Private	39,000					
	TOTAL	58,000					
Tupman	State of CA	685	Poor	30	32	0	Excellent
San Luis Island	FWS	751	Good	38	40	0	Excellent
Concord NWS	U.S. Navy	2,100	Excellent	33	45	0	Excellent
Grizzly Island	State of CA	8,600	Excellent	14	30	0	Good
Mount Hamilton	Private	35,000	Good	39	150[2/]	--	Good
Lake Pillsbury	USFS	18,000	Good	36	150	--	Good
	Private	4,000					
	TOTAL	22,000					
Point Reyes	NPS	2,600	Fair	17	300	0	Good
Jawbone Canyon	Private	3,000	Good	12	--[3/]	--	Good
Camp Roberts	U.S. Army	25,000	Good	19	--[3/]	--	Good
Fort Hunter Liggett	U.S. Army	4,000	Good	21	--[3/]	--	Good
California Zoos	Private	N/A	N/A	15	15	--	Good
TOTAL		361,736		827	1,452	0	

1/ Dependent on purchase of habitat and major changes in land use.
2/ Actual capacity to be determined after evaluation of herd behavior and habitat utilization.
3/ Data is not currently available to make an estimation of projected population levels.

in poor condition due to the affects of overgrazing on privately owned lands. These lands are of critical concern and must be acquired to insure the well-being of this herd.

Current legislation considers 2,000 as an appropriate tule elk population in California. The current estimated population is approximately 827 animals. This figure is low considering the estimated population of 800 animals in 1978 and a reproductive potential of 15 to 20 percent. The lack of data on the status of the 1978 calf crop at Lake Pillsbury, Mount Hamilton, and Jawbone Canyon in conjunction with what was considered a low count in the annual Owens Valley survey may be responsible for this apparent increase of approximately 4 percent.

Tule elk herds are currently below the prescribed or estimated maximum population level in all areas. Where population levels have been determined, currently established herds may reach a total population of at least 1,452 animals.

The adverse action of current or proposed land-use practices (Table 2) are presently only of significance for the Cache Creek and Owens Valley herds. These areas are, however, considered to be the two major herds in the state. A high priority should be given to minimizing the effects of these adverse actions. The LADWP has developed plans to increase the amount of ground water pumping in the Owens Valley. The anticipated impacts of such pumping upon elk habitat are significant. The LADWP has suggested mitigating measures which may decrease the effects of the project upon the elk. Two of these mitigation proposals are 1) to remove domestic livestock and 2) to allow periodic release of water from the aqueduct to create riparian, meadow type vegetation. The actual effect of the resulting habitat changes on the elk is, at this time, uncertain.

The Cache Creek herd is in jeopardy because of proposed changes in the use of private lands. The survival of this herd is dependent upon a public land managing agency acquiring the private lands which constitute a significant portion of this herd's habitat.

The land managing agencies, bureaus, and branches under the Secretary of the Interior, Secretary of Agriculture, and the Secretary of Defense are cooperating in making lands under their respective jurisdictions reasonably available for tule elk. In some cases, improving these lands to a condition suitable for elk requires the expenditure of funds for fences, watering facilities, or other developments. The military has been especially cooperative in making their lands available, so long as it is not required to divert military funds to accommodate the elk.

Tule elk reintroduction efforts in 1977 and 1978 resulted in the relocation of 195 animals and the establishment of 8 new herds. The relocation effort has been expensive, however. The CDFG, for example,

Table 2. Summary of Adverse Effects of Land-use Practices on the Tule Elk and the Status of Tule Elk Management Plans

Existing Herds	Possible Adverse Actions of Elk	Possible Adverse Actions of Land Use	Status of Herd Management Plan
Owens Valley	Farmland Depredation	LADWP Ground Water Pumping Increase ORV use Mining	Completed
Cache Creek	None	Private Subdivision Livestock Grazing Mining	Completed
Tupman	Habitat Deterioration	None	Completed
San Luis Island	None	None	Completed
Concord NWS	None	Livestock Grazing	Being Developed
Grizzly Island	Farmland Depredation	None	Being Developed
Mount Hamilton	Farmland Depredation	Livestock Grazing	Being Developed
Lake Pillsbury	None	ORV Use	Being Developed
Point Reyes	None	Livestock Grazing	Completed
Jawbone Canyon	Farmland Depredation	None	Delayed Pending Herd Status
Camp Roberts	Farmland Depredation	Increased Military Personnel Activity Livestock Grazing	Being Developed
Fort Hunter Liggett	None	Increased Military Personnel Activity Livestock Grazing	Being Developed

has spent approximately $128,000 on the relocation of 128 animals from the Owens Valley. Elk proof fencing, when it is required to contain tule elk, costs a minimum of $6,400 per mile for materials alone and if CDFG specifications are met costs of approximately $18,333 per mile are expected.

The location and evaluation of suitable habitat for the reintroduction of tule elk is continuing (Table 3). Tule elk numbers will be very near the legislated goal of at least 2,000 animals upon the attainment of potential population levels.

VI. ACTIONS NECESSARY TO PRESERVE THE TULE ELK

Several of those areas with established tule elk herds will require management action to ensure their continued suitability for the maintenance of a healthy tule elk population. Areas proposed for transplants also require some degree of treatment to make them suitable for reintroduction. The following is a listing of the highest priority actions, each of which is necessary to achieve the overall objective of the tule elk statewide management plan.

1. Develop and Implement Habitat Management Plans for Each Tule Elk Herd. Each land managing agency administering existing tule elk habitat or potential transplant sites should develop and implement formal cooperative habitat management plans for their lands. Each habitat management plan should outline procedures for the continued existence of herds in a healthy balance with their habitat, other wildlife, and various forms of land use. The manipulation of habitat to increase the carrying capacity of an area is a potential management practice. It is not, however, currently applicable to the present tule elk situation. The improvement of habitat on public lands utilized by the Cache Creek herd is at best keeping pace with the loss of habitat quality on private lands due to overgrazing. These private lands should be acquired and then managed for the benefit of tule elk.

The Owens Valley herd is currently at or near the prescribed carrying capacity of 490 animals. Any manipulation of the habitat to increase this number would, in the arid conditions of the Owens Valley, be contrary to the concept of managing tule elk on an ecosystem approach.

2. Continue to Identify Areas of Potential Tule Elk Habitat. An important part of achieving the management objective will be to carry on a continuing search for areas where elk can be relocated.

3. Provide the Funding Necessary to Reintroduce Tule Elk to Fort Ord. This area has excellent potential as tule elk habitat. The only limiting condition is the need for a boundary fence. This

Table 3. Potential Tule Elk Populations, Current and Proposed Habitat Areas

Areas	Current Number	Est. Max. Number
I. Existing Habitat Areas		
Owens Valley	463 (min)	490
Cache Creek	90	200[1/]
Tupman	30	32
San Luis Island	38	40
Concord NWS	33	45
Grizzly Island	14	30
Mount Hamilton	39	150[2/]
Lake Pillsbury	36	150
Point Reyes	17	300
Jawbone Canyon	12	--[3/]
Camp Roberts	19	--[3/]
Fort Hunter Liggett	21	--[3/]
California Zoos	15	15
II. New Habitat Areas[4/]		
Fort Ord	--	75
Vandenberg AFB	--	50
Cottonwood Creek	--	[5/]
Beale AFB	--	25
USFS Lands	--	[5/]
TOTALS	827	1,602

1/ Provided 12,000 acres of private land are obtained; otherwise the Cache Creek herd may be lost, thus reducing total by 200 animals.

2/ Capacity to be determined after evaluation of herd behavior and habitat utilization.

3/ Data are not currently available to estimate project population levels.

4/ Population potential for these lands is difficult to estimate at this time because all potential sites and their suitability for elk have not been evaluated.

5/ Habitat areas have not been fully identified or evaluated.

involves 9 miles of seven-foot high fence at a total cost, calculated in 1978, of $165,000. The Committee for the Preservation of the Tule Elk has expressed an interest in assisting in the raising of funds to facilitate this reintroduction.

4. Acquire or Manage Private Lands to Preserve the Existing Cache Creek Tule Elk Herd. Some 12,000 acres of crucial riparian and wet meadow habitats under private ownership are utilized by the Cache Creek herd as traditional rutting, feeding, calving, and bedding areas. These private lands must be acquired or managed by either a State or Federal agency or a private conservation organization to protect them from development, and thus safeguard the Cache Creek herd. Further, the Interagency Task Force on Tule Elk should complete an analysis to determine specific acquisition needs, costs and alternatives for acquisition, and responsibilities of participating agencies relative to the Cache Creek herd and other key areas involving private lands. The analysis should pursue alternative means of achieving objectives, including zoning and other similar land and resource management techniques.

5. Provide the Funding Required for the Preparation, Implementation, and Update of Habitat Management Plans by the Military and Those Other Federal Agencies Maintaining Tule Elk on Lands Under Their Jurisdiction. The preparation of a habitat management plan requires the detailed study of tule elk movements and requirements in any given area. Evaluation of herd boundaries, calving, holding, and other critical areas as well as range production on a seasonal basis are but a few of the questions that must be answered before the development of a habitat management plan. Land acquisition, brush conversion, and the construction of fences and watering facilities when necessary for implementation of habitat management objectives are also expensive processes. Similarly, the monitoring of progress in the attainment of habitat management plan objectives as well as the collection of data on tule elk demographics are major components in the maintenance of habitat management plan effectiveness.

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